

## Recommendations During Outbreaks of Measles: February 2015

- All persons at risk for exposure and infection should be vaccinated or have other acceptable evidence of immunity as described below.
- Infants aged 6-12 months may be vaccinated with MMR during an outbreak, ideally 1 month prior to any risk of exposure. Children who receive a dose of measles-containing vaccine before their first birthdays should be revaccinated with two doses of MMR vaccine, the first of which should be administered when the child is aged 12–15 months and the second at least 28 days later.
- Children aged 1 through 4 years who have received their 1st dose may receive the 2<sup>nd</sup> dose as long as 28 days have passed since the 1<sup>st</sup> dose during an outbreak.

### Routine Evidence of Immunity

- Evidence of adequate vaccination for school-aged children, college students, and students in other postsecondary educational institutions who are at risk for exposure and infection during measles outbreaks consists of 2 doses of measles-containing vaccine separated by at least 28 days.
- Laboratory evidence of immunity or lab evidence of disease
- Born before 1957
- Documentation of age-appropriate vaccination with a live measles virus-containing vaccine:
  - preschool-aged children and adults not at high risk: 1 dose
  - infants 6-11 months who travel internationally: 1 dose
  - school-aged children (grades K-12): 2 doses
  - health care workers: 2 doses
  - students at post-secondary educational institutions: 2 doses
  - adults with no other evidence of immunity who travel internationally: 2 doses

### Assessing Evidence of Immunity

- The criteria for routine evidence of immunity apply only to routine vaccinations. During outbreaks, recommended criteria for presumptive evidence of immunity might differ for some groups
- Vaccine doses with written documentation of the date of administration at age  $\geq 12$  months are the only doses considered to be valid. Self-reported doses and history of vaccination provided by a parent or other caregiver are not considered adequate evidence of immunity. Persons who do not have documentation of adequate vaccination or other acceptable evidence of immunity should be vaccinated.
- Serologic screening for measles immunity before vaccination is not necessary and not recommended if a person has other acceptable evidence of immunity to these diseases. Similarly, post-vaccination serologic testing to verify an immune response is not recommended.
- Documented age-appropriate vaccination supersedes the results of subsequent serologic testing. If a person who has 2 documented doses of measles- or mumps-containing vaccines is tested serologically and is determined to have negative or equivocal measles titer results, it is not recommended that the person receive an additional dose of MMR vaccine. Such persons should be considered to have presumptive evidence of immunity.
- Persons who have measles-specific IgG antibody that is detectable by any commonly used serologic assay are considered to have adequate laboratory evidence of measles immunity. Persons with an equivocal serologic test result do not have adequate presumptive evidence of immunity and should be considered susceptible, unless they have other evidence of measles immunity or subsequent testing indicates measles immunity.

### Outbreaks in Health-Care Facilities

- During an outbreak of measles or mumps, health-care facilities should recommend 2 doses of MMR vaccine at the appropriate interval for unvaccinated health-care personnel regardless of birth year who lack laboratory evidence of measles immunity or laboratory confirmation of disease.

- Health-care workers include all persons (medical or nonmedical, paid or volunteer, full- or part-time, student or nonstudent, with or without patient-care responsibilities) who work facilities that provide health care to patients (i.e., inpatient and outpatient, private and public). Facilities that provide care exclusively for elderly patients who are at minimal risk for measles and complication of the disease are a possible exception.
- If documentation of adequate evidence of immunity has not already been collected, it might be difficult to quickly obtain documentation of immunity for health-care personnel during an outbreak or when an exposure occurs. Therefore, health-care facilities might want to ensure that the measles immunity status of health-care personnel is routinely documented and can be easily accessed.

## Background Information

- **Measles Component:** The measles component of the combination vaccines that are currently distributed in the United States was licensed in 1968 and contains the live Enders-Edmonston (formerly called "Moraten") vaccine strain.
- **Immune Response to Measles Vaccination:** Measles-containing vaccines produce a subclinical or mild, non-communicable infection inducing both humoral and cellular immunity. Antibodies develop among approximately 96% of children vaccinated at age 12 months with a single dose of the Enders-Edmonston vaccine strain. Almost all persons who do not respond to the measles component of the first dose of MMR vaccine at age  $\geq 12$  months respond to the second dose.
- Response to the vaccine is similar in almost all respects to that noted in natural infection. Antibodies first appear 12-15 days after vaccination and peak at 21-28 days. To assure protection, vaccine should be given one month (28 days) before any potential exposure to measles disease.

## Measles Vaccine Effectiveness

- One dose of measles-containing vaccine administered at age  $\geq 12$  months was approximately 94% effective in preventing measles (range: 39%–98%) in studies conducted in the WHO Region of the Americas. Measles outbreaks among populations that have received 2 doses of measles-containing vaccine are uncommon. The effectiveness of 2 doses of measles-containing vaccine was  $\geq 99\%$  in two studies conducted in the United States.

## References

- Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013: Summary Recommendations of the Advisory Committee on Immunization Practices (ACIP) June 14, 2013 / 62(RR04);1-34 <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm>
- Vaccines, Plotkin & Mortimer p 242.
- CDC guidance for surveillance and outbreak control for measles, can be found in the Manual for the Surveillance of Vaccine-Preventable Diseases (<http://www.cdc.gov/vaccines/pubs/surv-manual/index.html>)